

ABSTRACT OF THE INVENTION

A method and apparatus for the extraction of water from a gas stream, such as atmospheric air. The method includes contacting the gas stream with a porous adsorbent material having a surface modifying agent adsorbed on the surface of a porous support. The surface modifying agent creates a hydrophilic surface for the adsorption of the water. After the water is adsorbed into the pores, the surface modifying agent is selectively desorbed from the surface. The water then evaporates from the pore and can be collected in a condenser. The method and apparatus of the present invention advantageously operate in a substantially isothermal manner, thereby reducing the size and power consumption of the device. The device can advantageously be used to extract potable drinking water from atmospheric air.